



Explosive Ordnance Disposal /Low Intensity Conflict (EOD/LIC)



Advanced Planning Briefing For Industry
February 21, 2006

**Combating Terrorism Technology
Support Office (CTTSO)**



Mission



To provide advanced technology and equipment solutions for Explosive Ordnance Disposal (EOD) technicians and Special Operations Forces (SOF) to meet the challenges of force protection and the war on terrorism. EOD/LIC development efforts focus primarily on detection, identification and neutralization of all types of conventional explosive ordnance and improvised explosive device (IEDs).



Program Membership



- **Joint Service Explosive Ordnance Disposal**
- **Special Operations Forces**



2005 Success Stories



Remote EOD Mini-Reconnaissance Vehicle - Bombot

- Completed development of the Bombot system, a low-cost and highly portable remote EOD mini-reconnaissance vehicle (MRV) based on COTS equipment.
- Designed for remote inspection of suspect objects and placing counter-charge to remotely destroy suspected threat devices.
- \$6.5 mil contract awarded by the PMS EOD to procure 2300+ Bombots, for use in Iraq and Afghanistan.





2005 Success Stories

Combatant Diver Display Mask

- Unimpeded visual access to diver life support information regardless of visibility.
- Developed integrated mask with diver display of essential life support information including depth, bottom time, and gas pressure via an RF link.





FY2007 Requirements



- **EL-2171 Low-Cost Military Robot**
- **EL-2174 Robot Navigation, Command, Control and Communication System**
- **EL-2176 Self Developing X-Ray Film**
- **EL-2177 Next Generation X-Ray Generator**
- **EL-2178 Autonomous Underwater Vehicle Obstacle Avoidance System**



Low-Cost Military Robot



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- **Develop a low-cost, expendable unmanned ground vehicle.**
 - **The system will provide the capability to remotely neutralize explosive threats in the absence of conventional EOD support.**
 - **Multiple frequency selectable by the user.**



Low-Cost Military Robot



- **The system will consist of three major components:**
 - **Operator Control Unit (OCU). OCU should be compact, rugged and allow ease of operation.**
 - **Communications Relay Unit with a secure video/data link between the OCU and the robot vehicle. Video should allow for operations in full daylight and low-light conditions.**
 - **Small, low-cost, expendable robotic vehicle with an explosive delivery capability. Vehicle should operate across diverse terrain and allow for integration of current explosive components.**



Robot Navigation, Command, Control and Communication System



- **Develop a JAUS (Joint Architecture for Unmanned Systems) compliant small robot command, control, communications and navigation system.**
- **The CPU will incorporate Semi-autonomous, way-point navigation / GPS / Mapping software allowing the robotic platform to move with limited help and have sight of the target or gather sensor data and provide that information to the rear over a flexible communication link.**



Robot Navigation, Command, Control and Communication System



- **Integrate laser range finder and other sensors.**
- **Integrate with existing man-portable robots.**
- **Explore possible use of alternative power technologies such as fuel cells.**
- **Support testing and demonstration.**



Self Developing X-Ray Film



- **Develop an x-ray film that replaces the two part wet film with a single part film that requires no post exposure processing. The film should have the following features:**
- **Develops in near real-time with dose range of 0.1mR to 500mR.**
- **Viewable from either side of the film.**
- **Easily cut and shaped to size of intended target.**



Self Developing X-Ray Film



- **Immersion proof and scratch resistant.**
- **Stable in light and dark.**
- **Usable in outside environment from 32-120 degrees F.**
- **Minimum six month shelf life with one year desired.**
- **Desired cost per sheet comparable to current x-ray film.**



Next Generation X-Ray Generator



- **Military forces use portable x-ray equipment to detect the presence of hazardous components in suspect devices and the condition of internal components in ordnance items.**
- **The military require an enhanced x-ray capability providing greater resolution than currently fielded systems.**
- **The desired system should be no larger than currently fielded systems.**
- **The system should be capable of operation in austere military field environments.**



Next Generation X-Ray Generator



Additionally, the system should have the following features:

- **Output 10mR/pulse @ 12 inches (goal: 30mR/pulse @ 12 inches).**
- **Pulse rate of 25 pulses/sec.**
- **Field replaceable X-Ray source.**
- **Average photon energy delivered on target 200keV.**
- **Output power programmable from 150keV to 300keV.**
- **Wireless capability between generator and control station.**
- **AC power with commercial battery option.**



Autonomous Underwater Vehicle (AUV) Obstacle Avoidance System (OAS)



- **Integrate a prototype OAS onto a Semi-Autonomous Hydrographic Reconnaissance Vehicles (SAHRV).**
- **SAHRV is a 7.5” diameter AUV.**
- **Develop algorithms to effectively control and maneuver the vehicle around detected obstacles while minimizing false alarms and data degradation.**
- **Demonstrate detection hardware and software performance against such anticipated threats as reefs, rocks, pilings, piers, seawalls, kelp, nets, ships, and shorelines.**



Autonomous Underwater Vehicle (AUV) Obstacle Avoidance System (OAS)



- **The OAS must detect upcoming obstacles, allowing AUV to swim horizontally around obstacles.**
- **The control algorithms will produce intelligent maneuvering that will minimize loss of data integrity (such as a side-scan sonar degradation due to erratic maneuvering) while minimizing the threat of vehicle collisions.**
- **OAS features may include low-power sonar and beam-forming technology, computer-aided detection and classification of sonar images, sonar array miniaturization, small underwater vehicle dynamics in near-surf-zone regions, and feature-based navigation.**



Program Contact Information



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